

WHAT IS CLAIMED IS:

1. A propulsion system for a watercraft comprising an internal combustion engine that defines a combustion chamber, an intake device that delivers air to the combustion chamber, a throttle valve that regulates an amount of the air, a control device that sets the throttle valve to a desired position, an operating unit that provides the control device with the desired position, and means for delivering at least a minimum amount of air that maintains an operation of the engine to the combustion chamber when an abnormal condition occurs in setting the throttle valve to the desired position.

2. The propulsion system as set forth in Claim 1 additionally comprising a valve position sensor configured to sense the actual position of the throttle valve, the control device being configured to determine whether the abnormal condition occurs based upon an actual position sensed by the valve position sensor and the desired position provided by the operating unit, the control device being configured to control the control valve to allow the secondary air to move to the combustion chamber when the control device determines that the abnormal condition occurs.

3. The propulsion system as set forth in Claim 2, wherein the control device is configured to determine that the abnormal condition occurs when a difference between the actual position of the throttle valve and the desired position is equal to or greater than a preset threshold value.

4. The propulsion system as set forth in Claim 1, wherein the means for delivering at least a minimum amount of air is a mechanism that automatically moves the throttle valve to a preset position.

5. The propulsion system as set forth in Claim 1 additionally comprising an outboard motor that has a propulsion device, the engine is incorporated in the outboard motor and powers the propulsion device.

6. A propulsion system for a watercraft comprising an internal combustion engine that defines a combustion chamber, a first intake device configured to deliver primary air to the combustion chamber, a first valve configured to regulate an amount of the primary air, a control device configured to set the first valve to a desired position, an operating unit configured to provide the control device with the desired position, a second intake device being configured to deliver secondary air to the combustion chamber, and a second valve configured to control a flow of secondary air to combustion chamber, the control device being configured to determine whether an abnormal condition occurs in setting the first valve to the desired position, the control device being

configured to determine whether the amount of the first air is insufficient, the control device being configured to control the second valve to allow the secondary air to move to the combustion chamber when the control device determines that the abnormal condition occurs and the amount of the first air is insufficient.

7. The propulsion system as set forth in Claim 6 additionally comprising a valve position sensor configured to sense the actual position of the first valve, the control device being configured to determine whether the abnormal condition occurs based upon an actual position sensed by the valve position sensor and the desired position provided by the operating unit.

8. The propulsion system as set forth in Claim 7, wherein the control device is configured to determine that the abnormal condition occurs when a difference between the actual position of the first valve and the desired position is equal to or greater than a preset threshold value.

9. The propulsion system as set forth in Claim 7, wherein the control device is configured to determine that the abnormal state occurs when the actual position of the first valve does not follow the desired position provided by the operating unit.

10. The propulsion system as set forth in Claim 6 additionally comprising a first valve actuator configured to actuate the first valve toward the desired position, the control device being configured to control the first valve actuator based upon the desired position provided by the operating unit.

11. The propulsion system as set forth in Claim 6 additionally comprising a second valve actuator configured to actuate the second valve between a shutting position that does not allow the second air to the combustion chamber and a releasing position that allows the second air to the combustion chamber, the control device being configured to control the second valve actuator.

12. The propulsion system as set forth in Claim 6, wherein the control device is configured to control the engine to increase an engine speed when the control device determines that the abnormal state occurs and the amount of the primary air is insufficient.

13. The propulsion system as set forth in Claim 6 additionally comprising a firing system configured to fire an air/fuel charge in the combustion chamber, the control device being configured to retard a firing timing of the firing system to decrease the engine speed during an abnormal state of the first valve.

14. A propulsion system for a watercraft comprising an internal combustion engine that defines a combustion chamber, an intake device configured to deliver air to the combustion chamber, a throttle valve configured to regulate an amount of the air, a control device configured to set the throttle valve to a desired position, an operating unit configured to provide the control device with the desired position, the control device being configured to determine whether an abnormal state occurs in setting the throttle valve to the desired position, the control device being configured to determine whether the watercraft is berthing, the control device also being configured to decrease an engine speed of the engine when the control device determines that the abnormal state occurs and the watercraft is berthing.

15. The propulsion system as set forth in Claim 14 additionally comprising means for detecting that the watercraft is berthing, the control device determining that the watercraft is berthing by an output from the means for detecting the watercraft is berthing.

16. A propulsion system for a watercraft comprising an outboard drive, the outboard drive having a propulsion device that propels the watercraft, the propulsion device being selectively operable at least in a forward or reverse mode, an internal combustion engine that powers the propulsion device, the engine defining a combustion chamber, an intake device configured to deliver air to the combustion chamber, a throttle valve configured to regulate an amount of the air, a control device configured to set the propulsion device in the forward or reverse position and to set the throttle valve to a desired position, and an operating unit configured to provide the control device with the forward or reverse mode and the desired position, the control device being configured to determine whether an abnormal state occurs in setting the throttle valve to the desired position, the control device also being configured to determine whether the operating unit provides the control device with the reverse mode, the control device further being configured to decrease an engine speed of the engine when the control device determines that the abnormal state occurs and that the operating unit provides the control device with the reverse mode.

17. The propulsion system as set forth in Claim 16 additionally comprising a valve position sensor configured to sense the actual position of the throttle valve, the control device being configured to determine whether the abnormal state occurs based upon an actual position sensed by the valve position sensor and the desired position provided by the operating unit.

18. The propulsion system as set forth in Claim 16 additionally comprising a changeover mechanism configured to move the propulsion device between the forward and reverse modes.

19. A propulsion system for a watercraft comprising an outboard drive, the outboard drive having a propulsion device that propels the watercraft, the propulsion device being selectively operable at least in a forward or reverse mode, an internal combustion engine that powers the propulsion device, the engine defining a combustion chamber, an intake device configured to deliver air to the combustion chamber, a throttle valve being configured to regulate an amount of the air, a throttle valve capable to be set to a desired position, an operating unit being configured to operate the propulsion device between the forward and reverse modes, a connecting device being configured to selectively connect the throttle valve and the operating device, and a control device configured to determine whether an abnormal state occurs in setting the throttle valve to the desired position, the control device being configured to activate the connecting device to connect the throttle valve and the operating unit when the control device determines that the abnormal state occurs.

20. The propulsion system as set forth in Claim 19, wherein the throttle valve is configured to regulate the amount of the air to decrease when the connecting device is activated.

21. A propulsion system for a watercraft comprising an internal combustion engine that defines a combustion chamber, an intake device configured to deliver air to the combustion chamber, a throttle valve configured to regulate an amount of the air, a control device configured to set the throttle valve to a desired position, an operating unit configured to provide the control device with the desired position, a communication device through which the operating unit can communicate with the control device, and an auxiliary operating unit configured to set the throttle valve to a desired position when an abnormal state occurs at the operating unit or in the communication device.

22. The propulsion system as set forth in Claim 21, wherein the communication device has an open node, the auxiliary operating unit has an output port detachably connectable to the open node.

23. The propulsion system as set forth in Claim 21, wherein the operating unit is configured to provide the desired position to the control device by a data packet, the control device being configured to determine that the abnormal state occurs at the

operating unit or in the communication device if the control device does not receive the data packet within a preset time.

24. The propulsion system as set forth in Claim 21 additionally comprising an alarming device, the control device being configured to control the alarming device to alarm when the abnormal state occurs.

25. A propulsion system for a watercraft comprising an internal combustion engine that defines a combustion chamber, an intake device configured to deliver air to the combustion chamber, a throttle valve configured to regulate an amount of the air, a control device configured to set the throttle valve to a desired position, an operating unit configured to provide the control device with the desired position, a communication device through which the operating unit can communicate with the control device, and an alarming device configured to emit an alarm when an abnormal state occurs in the communication device.

26. A control method for controlling a watercraft propulsion system that has an engine, comprising regulating an amount of air to the engine with a regulating device, setting the regulating device to a desired regulating position, providing the desired regulating position to an operating unit, determining whether an abnormal state occurs in setting the regulating device to the desired regulating position, and delivering at least a minimum amount of air to the engine so as to maintain an operation of the engine when the occurrence of the abnormal state is determined.

27. The control method as set forth in Claim 26 additionally comprising sensing an actual regulating position of the regulating device, and comparing the actual regulating position with the desired regulating position.

28. The control method as set forth in Claim 26, wherein the regulating device is a throttle valve.

29. A control method for controlling a watercraft propulsion system that has an engine, comprising regulating an amount of air to the engine with a regulating valve, setting the regulating valve to a desired regulating position, providing the desired regulating position to an operating unit, determining whether an abnormal state occurs in setting the regulating valve to the desired regulating position, determining whether the amount of the air is insufficient, and delivering a supplementary amount of air to the engine when the occurrence of the abnormal state is determined and the insufficient condition of the air is determined.

30. The control method as set forth in Claim 29 additionally comprising sensing an actual regulating position of the regulating valve, and comparing the actual regulating position with the desired regulating position.

31. The control method as set forth in Claim 29 additionally comprising actuating a control valve of an auxiliary air delivery device to deliver the supplementary amount of the air.

32. The control method as set forth in Claim 29 additionally comprising determining the amount of the air is insufficient when the regulating valve is placed adjacent to a closed position of an air delivery device more than an open position of the air delivery device.

33. The control method as set forth in Claim 29 additionally comprising increasing an engine speed of the engine when the occurrence of the abnormal state is determined and the insufficient condition of the air is determined.

34. A control method for controlling a watercraft propulsion system that has an engine, comprising regulating an amount of air to the engine by a regulating valve, setting the regulating valve to a desired regulating position, providing the desired regulating position by an operating unit, determining whether an abnormal state occurs in setting the regulating valve to the desired regulating position, determining whether the watercraft is berthing, and decreasing an engine speed of the engine when the occurrence of the abnormal state is determined and the berthing condition of the watercraft is determined.

35. A control method for controlling a watercraft propulsion system that has an engine and a propulsion device, comprising regulating an amount of air to the engine with a regulating valve, setting the regulating valve to a desired regulating position, providing the desired regulating position to an operating unit, providing a forward or reverse mode of the propulsion device to the operating unit, determining whether an abnormal state occurs in setting the regulating valve to the desired regulating position, determining whether the reverse mode is provided to the operating unit, and decreasing an engine speed of the engine when the occurrence of the abnormal state is determined and the provision of the reverse mode to the operating unit is determined.

36. The control method as set forth in Claim 35 additionally comprising sensing an actual regulating position of the regulating valve, and comparing the actual regulating position with the desired regulating position.

37. A control method for controlling a watercraft propulsion system that has an engine, comprising regulating an amount of air to the engine with a regulating device, setting the regulating device to a desired regulating position, providing the desired regulating position to an operating unit, determining whether the desired regulating position is normally provided to the regulating device by the operating unit, and triggering an alarm when the determination is negative.